

STUDYING THE HISTORY OF CHEMICAL WARFARE TO PREPARE  
CHEMICAL OFFICERS FOR THE FUTURE

A thesis presented to the Faculty of the U.S. Army  
Command and General Staff College in partial  
fulfillment of the requirements for the  
degree

MASTER OF MILITARY ART AND SCIENCE

by

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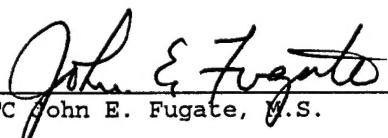
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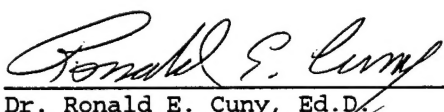
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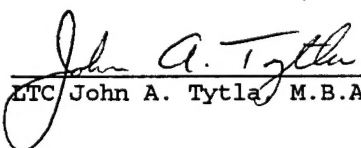
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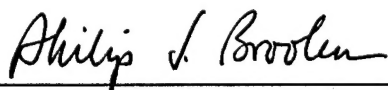
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## ABSTRACT

STUDYING THE HISTORY OF CHEMICAL WARFARE TO PREPARE CHEMICAL OFFICERS  
FOR THE FUTURE, by Major James E. Smith, CM, USA, 74 pages.

The United States Army Chemical School faces many challenges in training and educating chemical officers for the future. This thesis investigates the question of whether studying the history of chemical warfare can prepare chemical officers to function as effective leaders in combat and in operations other than war.

This study answers this question by analyzing the author's six objectives of the leader development process (qualities required of chemical officers in the future), analyzing the three pillars of the leader development process, and examining the components of the leader development process (simulation, doctrine, and military history) that are used by the Chemical School to train and educate chemical officers.

This study investigates why studying the history of chemical warfare should be included in the curriculum at the Chemical School and how studying the history of chemical warfare supports the accomplishment of the six objectives of the leader development process (qualities required of chemical officers).

The study concludes with recommendations to chemically personalize the Chickamauga Staff Ride and integrate the use of chemically focused vignettes, articles, and battle analysis into the curriculum at the Chemical School.

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## CHAPTER ONE

### INTRODUCTION

War by its very nature is chaotic, and while all of us do everything we can to bring some sort of order out of the chaos, we do not always succeed.<sup>1</sup>

General H. Norman Schwarzkopf  
Judging Errors of Judgment

#### Background

The United States Army is transforming as it moves into the twenty-first century. This is due to numerous changes in world events ranging from the destruction of the Berlin Wall, the collapse of the Soviet Union, the victory in the Persian Gulf War, and the increasing participation in operations other than war type missions. Part of this transformation includes downsizing.

However, this downsizing must not be at the expense of developing leaders. The leader development process must continue to prepare our leaders for combat in the twenty-first century. This will not be easy, but it must be done to secure victories in the future. Leader developers must remember that the ultimate purpose of the Army is to fight and win the nation's wars.

In 1992, the Army's Chief of the Chemical Corps and Commandant of the Chemical School, Major General Robert D. Orton, published Chemical Corps 2000, a pamphlet describing challenges the Chemical Corps face as the Army reacts to downsizing, power projection, new doctrine,

and emerging nation support missions. Major General Orton states, "The Chemical Corps, as an integral part of our national defense resource, must be prepared to accept new challenges."<sup>2</sup> He presents the following goals for the future of the Chemical Corps:

A Chemical-Ready Fighting Force. This goal is particularly difficult with the changing threat from one based on a superpower such as the Soviet Union, to one of numerous conflicts in all regions of the world which have the capacity to use nuclear weapons, chemical weapons, and biological agents. Changes in the Nuclear, Biological, and Chemical(NBC) organization result from the changes in the Army's infrastructure. Modernization initiatives, producing advanced technological equipment, cause change in materiel.<sup>3</sup>

Integrated Chemical Support. During times of combat, the Chemical officer must be an expert on all matters of NBC defense. Chemical officers, as members of the battle staff, must educate unit commanders on the NBC management process; integrate NBC doctrinal concepts; and employ smoke, decontamination, and reconnaissance assets. To effectively integrate chemical support, chemical officers must view themselves as commanders, as well as staff officers. They must know the capabilities, the personnel, the strengths, and the weaknesses of these assets and advocate their use. Further, chemical captains must maintain their own proficiency in NBC defense during peacetime while performing operational duties, such as unit status report officer (USR), sports officer, training officer, and tasking officer.

Chemical Support to the Nation. Providing chemical support to the nation is transforming the Chemical Corps into a branch focused toward meeting nontactical national and/or international requirements.

These requirements include missions to support U.S. and International Treaty Verification Processes, to train U.S. and International Treaty Inspectors and Escorts, to demilitarize the chemical stockpile, to manage the environment, to provide security assistance to foreign nations, and to battle narcotics.<sup>5</sup>

The challenge the Chemical Corps faces is to ensure that chemical officers are capable of performing the tasks associated with fighting in combat while performing operations other than war related missions.

#### The Problem

At a time when the threat from chemical and biological warfare is increasing, the Chemical Corps is assuming additional peacetime missions and roles, such as: (1) security assistance, (2) treaty verification/arms control, (3) chemical demilitarization, (4) environmental management and assistance, and (5) counternarcotics. The challenge for the Chemical Corps is to maintain the ability to prepare the Army to win in an NBC environment while performing these peacetime missions.

The problem facing the Chemical School is to ensure chemical officers are trained to perform in a chemical environment, while the focus of training and assignments shifts towards peace support operations. Unfortunately, this problem will not disappear. Training at the Chemical School must be modified to ensure all officers are trained for these additional missions. However, this could have a negative impact on the ability of the U.S. Army to operate effectively

in a chemical environment in the next war if the focus of instruction shifts too far away from warfighting to peace support operations.

This is an issue the Army is dealing with at the present time. James Kuhnhehn's article "Should Military Focus on War or on Peace" in the Kansas City Star on 2 October 1994 discusses the problem that confronts the Army and Chemical Corps. Mr. Kuhnhehn said that with more servicemen performing peacetime missions, fewer warriors are available in the Services. He discusses the feasibility of performing the increasing amounts of peacekeeping missions and of still being prepared to fight in one or more regional conflicts. He says that peacekeeping missions use valuable training time and training funds.<sup>6</sup>

The Chemical School must maintain an emphasis on training the tasks necessary for performing in a chemical environment or the training of chemical officers will suffer. The Chemical School must continue to provide its officers with the experience base and mental agility to perform in a chemical environment.

The Chemical School is using three tools to provide this experience base and mental agility for officers. The first is instruction in military history which analyzes the evolution of combined arms warfare. The second is instruction on Army and NBC doctrine stressing an understanding of combined arms principles and NBC doctrine. The third is the use of simulation reinforcing Army and NBC doctrine during simulation exercises.

Surprisingly, there is little instruction on the study of the history of chemical warfare during the history and doctrinal courses, a topic that may have relevance for the professional Chemical Officer.



Thus, the Chemical School may be neglecting an important tool to prepare chemical Officers for future combat.

### Thesis

The study of the history of chemical warfare can help prepare chemical officers to function as effective leaders in combat and in operations other than war.

### Research Question

How would the study of the history of chemical warfare prepare chemical officers to function as effective leaders in combat and in operations other than war. To answer this question, the following subordinate questions must be addressed:

1. How does the Army develop officers as leaders?
2. How does the study of doctrine develop leaders?
3. How does the study of military history develop leaders?

### Importance of the Study

As the number of countries with the capability to develop or purchase chemical weapons increases, the probability that these weapons will be used in regional conflicts and against the United States also increases. The Chemical School's task is to provide quality instruction that prepares officers for combat in a chemical environment, along with providing training to prepare them for peace related missions. This study may provide a tool (study of the history of chemical warfare) to help maintain quality. An understanding of the topic provides the chemical Officer with the educational background and experience to perform successfully in a chemical environment during combat.

### Limitations

The scope of this thesis is limited to the leader development of chemical captains. The focus is on the institutional pillar, specifically the Chemical School, of the leader development process and the chemical captain. However, the leader development pillars of operational assignments and self-development are examined to examine the leader development process. Captains are chosen because it is at this level that officers begin to make decisions in a chemical environment that have operational or strategic implications. However, the information, analysis, conclusions, and recommendations may also apply to the leader development of chemical lieutenants.

### Delimitations

This study does not consider the leader development of lieutenants and noncommissioned officers (NCOs), as well as the corresponding leader development courses.

### Assumptions

The first assumption is that the U.S. Army must be prepared to fight in a chemical environment. The second assumption is that the chemical officer must be the unit commander's expert for operations in a chemical or biological environment.

### Endnotes

<sup>1</sup>H. Norman Schwarzkopf, "Judging Errors of Judgment," The Retired Officer Magazine, December 1994, 30.

<sup>2</sup>Robert D. Orton, Chemical Corps 2000 (Fort McClellan, AL: U.S. Army Chemical School, 1993), 1.

<sup>3</sup>Ibid., 5.

<sup>4</sup>Ibid., 4.

<sup>5</sup>Ibid., 11.

<sup>6</sup>James Kuhnhenh, "Should Military Focus on War or on Peace," Kansas City Star, 2 October 1994, m-1.

## CHAPTER TWO

### LITERATURE REVIEW

The dynamics of the current world order, combined with the downsizing of the military, make leader development the essential component of an agile, flexible force required to face these many challenges.<sup>1</sup>

Lieutenant General John E. Miller,  
Commandant, U.S. Army  
Command and General Staff College

Chapter Two provides the reader with relevant information on military history, doctrine, simulation, and the study of the history of chemical warfare as it pertains to the research question: How would the study of the history of chemical warfare prepare chemical officers to function as effective leaders in combat and in operations other than war? This chapter begins with a description of the leader development process in developing chemical officers, and concludes with an examination of the tools the Chemical School uses to develop chemical officers.

#### The Army's Leader Development Process

The leader development process develops confident and competent leaders. This development occurs over time and involves attendance at Army Schools, performance in operational assignments, and individual study by officers. The intent or end-state of the process is identified by determining the function or role expected of a brigade chemical

officer or chemical company commander. Brigade chemical officers help in preparing Army units to operate in a chemical environment. Chemical company commanders provide command and control for units and provide vital NBC support to higher-level units to deter, detect, or decontaminate in a chemical environment. Thus, the end-state of the process is a chemical captain who functions either as a brigade chemical officer or chemical company commander to assist Army units in functioning effectively in an NBC environment.

#### Leader Development Objectives

To accomplish this end-state, the leader development process must produce chemical officers with the following qualities otherwise known as objectives of the process. A description of each objective is presented below.

1. Objective of Tactically and Technically Competent and Confident Officers: FM 100-5, Operations, says that the essential element of combat power is competent and confident leadership. Further, the manual states that there is nothing more important in peacetime than for an officer to study his profession, and become tactically and technically proficient. The regular study and teachings on military doctrine, military history, and biographies of military leaders are invaluable in acquiring competence and confidence.<sup>2</sup>

General J. H. Binford Peay III, Army Vice Chief of Staff, described the importance of this objective in "Building America's Power Projection Army." He said that the Army's leadership programs are emulating General Marshall's idea of intensive school and leader

development during peacetime. He said that this objective provides the basic foundation upon which other objectives are built.<sup>3</sup>

General Gordon R. Sullivan, Army Chief of Staff, stressed the importance of the first objective by saying that the first step in becoming a leader is to be an expert. He said that in the professional, knowledge is power and the capacity to gather information, interpret, organize, and use available information is important in developing versatile leaders.<sup>4</sup> This objective is necessary in achieving the objective of versatility. General Sullivan put it this way: "Without excellence in the basics, versatility is impossible."<sup>5</sup>

For those who believe trust is the cornerstone of leadership as does Major Mark D. Rocke, competence is the second building block of trust, following after integrity. He said that competence is measured through tactical proficiency, familiarity with doctrine, and physical fitness.<sup>6</sup> Based on these comments, it is no surprise that technical and tactical competence is classified as one of the seven leadership imperatives suggested for the future battlefield.

This objective provides the basic foundation for the other objectives. Chemical captains must have the knowledge, the attitude, the skills, and the habits to intuitively display tactical and technical competence and confidence. This objective is extremely important for chemical officers since staff chemical officers spend the majority of their time in operational assignments doing work unrelated to chemical matters.

2. Objective of Versatile Officers who are Situationally Aware, are Mentally Agile, and are able to deal with Chaos: Versatility is one of the five tenets of successful Army Operations. These tenets

are essential for victory. FM 100-5, Operations, says that versatility is the ability to meet diverse requirements.<sup>7</sup> General Sullivan says that versatility is the ability to improvise in uncertain and changing battlefield conditions. Versatility is important in determining who the enemy will be. Strategic uncertainty and ambiguity are the essential characteristics of this new world order.<sup>8</sup> General Sullivan believes that the power projection Army requires leaders who are comfortable with change and uncertainty. He said that more junior officers may find themselves in situations where they have to make decisions at the operational and strategic levels as well as the tactical level. This requires that the Army's leader development program educates and creates leaders comfortable with change and uncertainty and prepared to make decisions with operational and strategic implications.<sup>9</sup>

Due to the many varied jobs chemical officers perform in operational assignments, they need versatility to successfully perform the tasks expected of them.

3. Objective of Intuitive Skills Such as Vision, Innovation, Adaptability, and Creativity: TRADOC Pamphlet 525-5, Force XXI Operations, states that future leaders must have intuitive skills, such as vision, innovation, adaptability, creativity, and the ability to simplify complex situations and clarify ambiguities while operating under stress. These higher-level cognitive skills are essential for the future leader.<sup>10</sup>

Perry M. Smith, a retired Air Force Major General who served as Commandant of the National War College, wrote in his book Taking Charge that intuition and vision were two of his twenty leadership fundamentals. He said that leaders must trust their intuition. He believes it



is important for officers to have intuition, which is having your "antennae" out, keeping your finger on the pulse of the unit, and becoming "street smart." Similarly, Perry Smith said that leaders must provide vision. They must plan, set goals, and provide strategic direction for their unit.<sup>11</sup>

Major Jose A. Picart in "Expert Warfighters with Battlefield Vision" said that the essence of battlefield vision is intuition. He believes success in future wars will require leaders with effective battlefield intuition. Intuition allows leaders to sense how the flow of events on the battlefield will affect future operations. He further stated that it is intuition that is critical in reducing the fog of war and promoting initiative and audacity. He said that intuitive people share one characteristic: they are experts in a particular field of knowledge. Mastering warfighting knowledge is what makes intuition and vision possible. This is because the officer can draw from the vast store of expert knowledge and match the current tactical situation with similar historical experience. After matching the information, the officer can form expectations about future events.<sup>12</sup>

This objective will be essential if chemical captains become involved in operations other than war (OOTW) and have to make decisions of operational and strategic implications with little guidance from their senior leaders. Thus, the higher-level cognitive skills must be developed as soon as possible in the leader development process.

4. Objective of Credible Spokesperson: Standing up for your beliefs and speaking with a passion are two of the fundamentals that help build credibility. These two fundamentals lead to credible spokespersons who are able to communicate with excitement a vision or

dream.<sup>13</sup> Perry Smith said that a leader must be a good communicator. He said that a dynamic communicator can motivate people to accomplish missions and have a positive impact on the organization.<sup>14</sup>

Wesley K. Roberts in "Battlefield Leaders for the Twenty-First Century: The Razors Edge of Leadership," said that a substantial improvement of interpersonal communication skills is one of the leadership levers that will be a valuable tool in combat in the next century. He said that interpersonal skills are key leverage factors in establishing and gaining followership, an essential ingredient for combat unit effectiveness.<sup>15</sup>

Colonel (Retired) Richard M. Swain, Associate Professor of Military Art and Science and Director of Fellows at the School of Advanced Military Studies, Command and General Staff College, described the importance of a credible spokesperson in "Adapting to Change in Times of Peace." Swain said that a credible spokesperson is crucial to the success of the Army. He said that the Army of 1960s failed because it did not have a credible spokesperson, while the Army of the 1990s succeeded because of credible spokespersons, such as General Colin Powell.<sup>16</sup> Likewise, chemical captains must be credible spokespersons who are able to articulate the many concerns in NBC defense and ensure the implementation of their chemical training program.

5. Objective of Open-Minded Officers: John W. Gardner, author of On Leadership, said that visionary leaders are those who possess wisdom, are able to deal with change and emerging trends, have the wit and courage to act, and are open-minded and good listeners.<sup>17</sup> Again Perry Smith included this objective as one of his twenty fundamentals for leadership. He said that the best leaders are those whose minds are

never closed, hear new points of view, and are eager to learn from new issues.<sup>18</sup>

General Sullivan said that new ways of thinking, deciding, and acting are required as the Army moves to the future. He said that we all must become professional thinkers, able to come to grips with the future just like Patton did during the interwar period by pondering and acting on new ideas and innovations in the hope of advancing his profession.<sup>19</sup>

Again, chemical captains, possibly facing new and ambiguous situations must be open-minded about what may be successful in the next war, not only on what was successful in the last war.

6. Objective of Officers Understanding Technology: Wesley K. Roberts said that a conceptual mastery and command of technology is one of the leadership levers that will be a valuable tool in combat in the next century.<sup>20</sup> TRADOC Pamphlet 525-5, Force XXI, Operations, also stressed that leaders will be schooled and skilled in using technology.<sup>21</sup>

As the Army becomes more technologically advanced, chemical officers must ensure that they understand technology to facilitate fighting in the next war. All officers should be computer literate to be able to use this technology.

These objectives are suitable to accomplish the end-state of the process. They are not new and have been expected of our officers for the past twenty years. In reality, producing great military leaders with these following qualities have been the forte of the U.S. Army leader development process.<sup>22</sup>

### The Design of the Leader Development Process

DA PAMPHLET 600-32, Leader Development for America's Army-The Enduring Legacy, describes the Army's approach to leader development. The approach or internal design of the process is based upon three pillars--institutional training and education, operational assignments, and self-development.

General Gordon R. Sullivan, Army Chief of Staff, gave a good assessment of the current design of the leader development process in "Leadership Development" that described the leader development strategy as sound and remains structured around the three current pillars. He said that the three pillars provide a good foundation for developing quality leaders and an Army for the twenty-first century.<sup>23</sup>

This assessment of the process was also articulated by Brigadier General Randall L. Rigby, Deputy Commandant, Command and General Staff College and Executive Agent for the Chief of Staff of the Army for Leader Development. He said in an Officer Professional Development session titled "Leader Development" to the Command and General Staff College on 23 November 1994, that the current leader development strategy revolved around the three pillars is still good, even with a changed world.<sup>24</sup>

Although the senior leadership of the Army agree the three pillars are good, it is important to examine each pillar. The strengths and weaknesses of the three pillars will be described in an attempt to examine the internal design of the process.

### Institutional Training and Education Pillar

Institutional training and education include all the formal schooling that officers receive. Officers are trained on the critical tasks required to perform in operational assignments. Institutional training provides the foundation for the leader development process.

The strength of the institutional training and education pillar is that it produces tactically and technically competent and confident officers. Major Picart in "Expert Warfighters with Battlefield Vision" wrote that the Army's commitment to provide officers a professional education in institutions is outstanding.<sup>25</sup>

While institutional training provides a solid foundation for tactical and technical competence, it is lacking in developing the cognitive skills, such as intuition, versatility, and open-mindedness. Roderick R. Magee II in "Building Strategic Leadership for the 21st Century," said that Army Schools Systems from officer basic-level to mid- and senior-level colleges have placed a heavy emphasis on warfighting skills to the exclusion of developing conceptual skills. He emphasized that cognitive ability or skills cannot be developed only by experience, it requires a combination of education at schools and long-term development through experience.<sup>26</sup>

This was echoed by Lieutenant Colonel J. Steve Patterson in "CAS3: Investment in the Future," in which he said, "CAS<sup>3</sup> [Combined Arms Services Staff School] is a place where officers learn to think. The key here is that CAS<sup>3</sup> does not teach them what to think, but how to think. Every other school in the Army teaches things."<sup>27</sup> The Chemical School, as a TRADOC School, is no exception. It teaches things.

However, teaching of cognitive skills in the Army Schools has been given some consideration. Recently, General William M. Steele, former Deputy Commandant, U.S. Army Command and General Staff College, addressed this issue when he asked if and at what level should officers be taught the higher cognitive skills, such as intuition, reasoning, and tolerance for complexity and ambiguity.<sup>28</sup>

The reason why the institutional pillar is deficient in developing cognitive skills may have been answered by Marine Corps Captain Michael F. McNamara's article in "The Price of Remaining Amateurs in the Field of Education." He said that military institutions are faced with a problem of conveying course matter that stimulates the student's fascination for education and inspires them to pursue self-development once they leave the school. He said that military institutions can have two effects on students: (1) introduce them to rigorous intellectual demands by inducing them to think or (2) alienate them from intellectual demands by teaching too much and failing to stimulate them to think.<sup>29</sup> McNamara hit it right on the head when he said that the root of the problem is the instructor at the school. The instructor creates the essential condition for learning to occur; the student is responsible for learning.<sup>30</sup>

If the strength of any educational institution is the instructor, then the problem facing Army Schools, particularly the Chemical School, is not only of having instructors who can facilitate thinking amidst a jam-packed schedule, but also of having enough instructors. The effects of downsizing on Army Schools are resulting in a shortage of instructors.

Army Lieutenant Colonel Herbert F. Harback discussed the effect of downsizing on the institutional pillar in "The Threat to Strategic Leadership." He said that downsizing (both money and people) could have a streamlining effect on the educational process that reduces faculty positions and class numbers, and increases workload for the remaining faculty.<sup>31</sup>

Another weakness is the curriculum in institutional training. Major General William M. Steele said that the Army's current military education course was designed to prepare students for the Cold War. He further said that lessons, exercises, and evaluations were designed to meet the challenges of the Cold War battlefield.<sup>32</sup>

Despite these weaknesses, the institutional pillar is still very important in the leader development process. It remains as important today as it was in the Army of the 1920s and 1930s. If you look at the centerpiece of the Army's preparation for war in the 1920s and 1930s, it was an educational system that produced leaders with foresight, depth of knowledge, and flexibility. This point was reinforced by Captain Mark D. Rendina in "An Officer Corps for the 1990's." He noted that the superb leadership of World War II was a product of an officer corps that was prepared for war through a challenging schoolhouse education and intensive academic experimentation that was leavened with sufficient troop experience.<sup>33</sup>

#### Operational Assignment Pillar

Although the Army has an excellent school system, the majority of an officer's career is spent in operational assignments. Operational



assignments allow the officer to gain experience and apply theory learned during formal schooling.

Most of leader development occurs in the operational assignment pillar. During a 1985 Professional Development of Officers Study (PDOS), fifty-one percent of the officers said that duty assignments made the greatest contribution to their professional development and ninety-five percent said previous assignments were helpful in preparing them for their present assignment.<sup>34</sup>

The strength of this pillar is that it continues the development of tactically and technically confident and competent leaders. The long-term benefit is that it also develops versatile officers and open-minded officers. The key reason for the strength of this pillar is the mentoring the officer receives. Colonel Michael Anastasio said that the commander's direct involvement is crucial in developing officers during operational assignments and is the heart of this pillar, if not of the process.<sup>35</sup> Additionally, experience in operational assignments and training at Army Schools provides the tactical and technical competence junior-leaders need.<sup>36</sup>

Operational assignments have served chemical captains arriving at the Officer Advanced Course very well. Most Lieutenants have served as battalion chemical officers who worked directly for the battalion S-3 and the battalion commander. The opportunity of being mentored by a battalion S-3, probably just out of the resident Command and General Staff College (CGSC) and a Lieutenant Colonel, one of the few chosen for battalion command, is unmatched by any in the Army. This mentoring continues after the advanced course as chemical captains are assigned as

brigade chemical officers and work directly for the brigade S-3, again the cream of the crop and most likely headed for battalion command.

The main weakness of this pillar as applied to all Army captains, including chemical captains, is in maintaining a warfighting focus. This is due to the lack of time in tactical units. The heart of the problem lies with the increasing amounts of peace-related missions that operational units perform. After gaining experience in a division after the Officer Advanced Course and becoming branch qualified, rewarding nominative assignments are offered at TRADOC Schools or Centers, ROTC, AC/RC, Arsenals, and/or Recruiting Commands. These nominative assignments broaden the experience base of the chemical officer. Unlike the combat arms captain who needs time in tactical units to develop warfighting skills, the chemical captain at this stage of his career (after company command) need assignments away from troops to prepare for battalion and brigade-level commands in the non-tactical Army.

Captain Mark D. Rendina in "An Officer Corps for the 1990s" said that it is those assignments away from troops, particularly teaching in Schools and in staff positions that led to the success of World War II leaders. As such, he advocates deglorification of troop assignments and more glorification for education and staff positions.<sup>37</sup> While this assignment pattern would reward captains and majors for leaving warfighting positions to seek non-warfighting positions, it could have a disastrous effect on the warfighting Army.

This sentiment was discussed by Major Picart in "Expert Warfighters with Battlefield Vision" in which he said that an officer is removed from tactical warfighting units immediately following company

command and assigned to TDA units and/or nominative duty. The officer then fails to acquire warfighting knowledge for up to six years. This results in a competent and determined leader, but one without the warfighting expertise to fight and win on the future battlefield. Picart said it is this warfighting expertise that is essential in the development of cognitive skills, such as intuition, vision, and mental agility.<sup>38</sup>

Despite the varying views on operational assignments, overall the operational assignment pillar is serving the chemical captain well and helps develop captains who are versatile, open-minded, credible spokesmen, and competent, although not necessarily in warfighting expertise.

#### Self-Development Pillar

This pillar is probably the most important of the three pillars but it is the weakest of the three. Although formal schools and operational assignments provide professional development, the rapidly changing world requires the chemical officer to learn and study everything possible about his profession.

Colonel Anastasio said that a professional officer must have a lifelong commitment to self-development, and that this development must build upon formal schooling and duty assignments. He further stated that each officer is responsible for his own professional development and that a self-development program should include a professional reading program setup by the branch/functional proponent, off-duty study and research, and duty related advanced schooling.<sup>39</sup>

Major General Robert D. Orton, former Chief of the Chemical Corps, wrote in the brochure "Chemical Corps Professional Reading Program 1994," "The true profesional reads, studies, and reads some more, always adding to his or her body of knowledge and understanding of the chosen profession."<sup>40</sup> The Chemical Corps publishes a reading program, however, operational assignments limit the time to read and study. The lack of time for self-development is the biggest problem with this pillar. What Colonel Anastasio said about self -development for warrant officers is true for chemical officers. He said that self-development is most likely the most overlooked element of the leader development process. Officers are expected to stay abreast of the latest changes in doctrine, organizations, and equipment in their areas of expertise.<sup>41</sup> This is particularly true with brigade chemical officers who mainly perform operational duties in the S-3 section. It is crucial that chemical captains find time to conduct professional studies while performing as brigade chemical officers.

This weakness in self-development is not unique to the Chemical Branch; it is Army wide. Major Jose A. Picart said the Army has "no systematic program for instilling in officers a full-time commitment to study war, it's history, doctrine, the threat, and the capabilities of soldiers and machines."<sup>42</sup> He recommends that the Army implement a required reading program similar to the one implemented by the Marine Corps in the early 1990's. This required reading program included books on history, leadership, strategy, and biographies. Picart believes the Army must implement a program that encourages, reinforces, recognizes, and rewards officers for independently acquiring warfighting knowledge through self-study.<sup>43</sup>

Overall, the literature suggests the leader development process is sound, but it also suggests each pillar need to be some fine tuning.

#### The Curriculum of the Leader Development Process

The curriculum used in the leader development process to develop chemical officers includes both process and content. The content is based on the study of military doctrine and history of combined arms warfare. The process utilizes simulation to teach this content.

#### Simulation

Simulation is a process that plays an important role in the way the Army prepares officers for the future. As resources of the Army decline, the Army is using simulation to maintain readiness. Computer supported simulation attempts to replicate roles and missions that must be accomplished on the battlefield. Exercises in a simulated NBC environment provide the chemical officer a tool to prepare for a future conflict with chemical weapons."

Peter Perla in "Future directions for Wargaming" described the disadvantages of simulation to prepare for future combat. The first is that no amount of simulation substitutes for actual experience in combat environments. Second, poorly designed games provide information that manipulates players to advocate an unrealistic solution to a problem. Perla gave an example of the Naval War College in the 1930s and the simulation models that stressed the value of mechanics over people. The Navy War College designed a game that overemphasized the importance of systems and de-emphasized the importance of players' decisions. As a result of the simulation, Navy commanders were put at a disadvantage

during the early stages of World War II when the "real" enemy did not conduct war by the rules developed by the Navy War College.<sup>45</sup>

The usefulness of simulations to prepare the Army for the future is highlighted in the article "Moving into the 21st Century: America's Army and Modernization." According to the author, General Gordon R. Sullivan, the Army must use the tools of the Combat Training Centers, simulation, Louisiana Maneuver (LAM), and Battle Labs to prepare for the future.<sup>46</sup>

Experimentations with simulation, relying on advanced technology, is the route the Army is taking to prepare officers for the future. This provides the Army a means to look at changing doctrine, training, leadership, organization, and material. General Sullivan says the Army "will meet the challenges of the future by rewarding experimentation, innovation, and prudent risk taking."<sup>47</sup>

Training is done with three types of simulation. Virtual simulation provides the soldier the feel of actually using equipment at a low cost. This simulation provides lowcost methods of experimentation. Constructive simulations consists of wargames and models that rely heavily on mathematical and algorithmic methods. Examples are the standard computer programs such as the Corps Battle Simulation (CBS) program oriented toward training higher-level staffs. Live simulation, such as field exercises at the Combat Training Centers, provides as near as actual combat experience as possible. Live simulations are the most realistic and the most costly, but bring soldiers and equipment together to operate in a training environment.<sup>48</sup>

The pamphlet Louisiana Maneuver describes the Louisiana Maneuver (LAM) process. General Frederick M. Franks, Jr., Commander of U.S. Army Training and Doctrine Command, said "Louisiana Maneuvers will enable the Army to think and grow taking charge of the process of change."<sup>49</sup> Army Focus 93 describes the value of simulation in LAM, a high technological laboratory helping the Army leadership learn about warfare in the 21st Century. Simulations are helping to predict what must be accomplished on the future battlefield. Louisiana Maneuvers provide senior leaders with a process to try out new ideas within today's budget constraints. This allows the Army to think, grow, and change toward the twenty-first century. The LAM is connected with six battle labs and links science and technology to define, test, and analyze new ideas.<sup>50</sup>

The U.S. Army Chemical School has jumped on the technology bandwagon and has a state-of-the art simulation facility. The School was the first Army Training and Doctrine Command (TRADOC) branch school to receive and operate the Brigade/Battalion Simulation System (BBS). The BBS uses CHEMSIM, a simulation program that presents modeling of chemical contamination, NBC hazard prediction, FOX reconnaissance vehicles, M1059 and M1037 smoke generator systems, M12A1 and M17 decontamination apparatuses, chemical reconnaissance, smoke effects, radiological operations, and nuclear blast effects.

Each Chemical Officer Advanced Course (COAC) class participates in two exercises (CPXs) involving the BBS and Tactical Training System (TTS), a computerized simulation and audio-visual presentation system used with BBS to support tactical and NBC training.<sup>51</sup> An Army/Brigade Operations CPX supports the Army operations doctrinal instruction while



a Chemical/Biological/Smoke CPX supports NBC doctrinal instruction. The Army/Brigade Operations BBS CPX is conducted during the eighth and ninth weeks. Officers participate in the deliberate decision-making process in the eighth week to develop plans that are executed using BBS during the ninth week. The focus of this two-week exercise is to reinforce instruction on the decision-making process and tactics per Army Operations doctrine and combined arms instruction.

The Chemical/Biological/Smoke CPX is conducted during the nineteenth week. Two days of planning are allocated to develop plans oriented on employing decontamination, reconnaissance, and smoke assets. Two days are used to execute the plan using BBS. This CPX reinforces NBC doctrinal instruction as well as Army doctrine. A third BBS CPX is under development to reinforce instruction received in the Tactical Radiological Operations block and Nuclear Target Analysis block.<sup>52</sup> Officers leaving the Chemical School after experiencing these BBS exercises reinforcing doctrinal instruction are better prepared to perform as brigade chemical officers or chemical company commanders.

The main strength of simulation is that the Chemical School can train and educate all students, including captains on the nature of nuclear, biological, chemical, smoke, and obscurant environments. The Chemical School recognized early on the importance of the use of simulation and information technology in educating it's officers. The fielding of the Brigade/Battalion Simulation System (BBS) and Simulation Center known as the Dragon Warfighter Center has provided training to captains in staff procedures to prepare them for their role as special staff officers.<sup>53</sup> Specifically, the use of simulation at the Chemical School develops or reinforces an understanding and application of NBC

doctrinal principles, reinforces the use of the tactical decision making process, exercises battle tracking, develops a sense of situational awareness that anticipates changes on the battlefield, and provides an environment with the "fog of battle," or at least as close as simulation can approximate it.<sup>54</sup>

While simulation is a good tool for leader development, there are some weaknesses. The first is computer simulation can't measure an individual's intuitive, tenacity or panic as it tries to approximate "the fog of war."<sup>55</sup> The second weakness is that simulation exercises are subject to manipulation due to a combat developers bias that may allow flawed doctrine to succeed in simulation exercises. Simulations are only as good as the assumptions on which algorithms are based. Those assumptions are sometimes based on doctrine but most of the time are approximation to inherently complex problems.<sup>56</sup>

#### Doctrine

FM 100-5, Operations, defines doctrine as a statement of how the Army intends to conduct war and operations other than war. Doctrine incorporates lessons of warfare and the wisdom of the Army leadership in establishing a guide in conducting wars. This doctrine or refined theory sets the direction and the standard for leader development, soldier training, and modernization.<sup>57</sup>

TRADOC PAMPHLET 525-5, Force XXI Operations, describes the importance of doctrine in preparing the Army for the twenty-first century. The pamphlet states that doctrine will remain the engine of change for Force XXI, driving change in training, equipment, and organizational requirements.<sup>58</sup>

Lieutenant Colonel Michael R. Rampy in "The Keystone Doctrine: FM 100-5, Operations," describes the role of doctrine as providing the intellectual focus for the Army. This intellectual focus stimulates dialogue and strengthens the Army organization by assessing the influence of the past, the impact of the present, and the uncertainty of the future. He further said that doctrine provides the vital link between reality and theory.<sup>59</sup>

External influences, such as threats, national security policy, and budget constraints affect the way doctrine is developed. The impact of technology plays an important role in influencing doctrine as technology continues to have a dramatic impact on the nature of war.

Internal influences include institutional experiences and parochialism. Experiences are important in putting operations in context. This prevents the Army from basing doctrine on isolated and single instances of success or failure. Accepting doctrine as a prediction for the future is a recipe for disaster. Lessons learned must be continuously reevaluated to ensure doctrine is sound.<sup>60</sup>

Rampy concluded the article by describing the importance of FM 100-5, Operations, the keystone doctrinal manual for the Army. He said that the manual is the central doctrinal manual for managing adaptation and change for the Army.<sup>61</sup>

A large portion of COAC instruction focuses on teaching Army and NBC doctrine. The fundamentals of Army doctrine are taught from the fourth through the seventh week. This instruction is based on FM 100-5, Operations, and includes lectures and practical exercises on the offense, the defense, and on the combined arms team at brigade level.<sup>62</sup>

The fundamentals of NBC defense are taught using NBC doctrinal manuals from the eleventh to thirteenth week. Chemical officers receive instruction on these manuals ensuring application of skills during the performance in operational assignments. Application of contamination avoidance, protection, decontamination, and smoke fundamentals explained in these doctrinal manuals helps reduce the impact of CB weapons on the battlefield. Tactical radiological operations using FM 3-3-1, Nuclear Contamination Avoidance, is presented in the fifteenth and sixteenth week.<sup>63</sup>

Several NBC doctrinal manuals are used to support instruction at the Chemical School. FM 3-3, Chemical and Biological Contamination Avoidance, is the Army's primary doctrinal reference on CB contamination avoidance. Chapter One describes how to conduct a CB threat assessment using the IPB process. It also describes how to conduct a vulnerability analysis and determine vulnerability reduction measures. Chapter two describes the NBC Warning and Reporting System (NBCWRS) and how to manage the system to warn units of an enemy CB attack. Detailed measures for identifying, detecting and plotting CB hazards are presented in the remainder of the manual. After studying this manual, the chemical officer is equipped to assess the threat capability, identify the vulnerability of friendly units, describe the behavior of CB agents, and plot CB hazards on the battlefield.<sup>64</sup>

FM 3-3-1, Nuclear Contamination Avoidance, is a manual for separate brigades, divisions and higher level NBC Control Centers that describes contamination avoidance principles for nuclear operations.

FM 3-4, NBC Protection, is the doctrinal manual on nuclear, biological, and chemical (NBC) protection. Chapter one describes

individual protective, detection, first aid, and decontamination equipment. Chapter Two describes the Mission Oriented Protective Posture (MOPP), a methodology for determining levels of force protection. This assessment of a unit's chemical vulnerability leads to a decision on where to place alarms and what the masking criterion is. Chapter Three describes chemical vulnerability assessment, a process to estimate the probable hazards to be faced on the battlefield. Chapters Four and Five describe the actions taken before, during, and after a chemical, biological or nuclear attack. Chapter Six provides doctrine for collective planning, operations, and entry/exit procedures.<sup>65</sup>

FM 3-5, NBC Decontamination, is the Army's doctrinal manual on NBC decontamination. It describes how to reduce contamination hazard by removal or neutralization. Detailed procedures for conducting decontamination operations are presented. Chapter One describes decontamination concepts, principles, and levels. Chapter Two, Three, and Four describe in detail the techniques of immediate, operational, and thorough decontamination. The succeeding chapters describe decontamination of fixed sites, key terrain, urban areas, aviation equipment, and patients.<sup>66</sup>

FM 3-19, NBC Reconnaissance, is the doctrinal guide for NBC reconnaissance. Guidance on planning and executing NBC reconnaissance missions and chemical/biological (CB) sampling missions is highlighted in the manual. Chapter Three provides the six fundamentals of NBC reconnaissance. Chapter Four provides the actions for planning and preparing NBC reconnaissance operations. Succeeding chapters provide the five critical tasks (detect, identify, mark, report, and sample) that NBC reconnaissance performs on the battlefield. Principle and

techniques used by NBC reconnaissance units are identified and explained. Capabilities and limitations of these units are also presented.<sup>67</sup>

### Military History

The study of military history provides the professional officer an opportunity to perfect his craft before translating their knowledge into action. If studied effectively, military history enables the officer to make sense of the present and anticipate the future.<sup>31</sup>

The study of military history became a special field within the history discipline in the early 1800's.<sup>68</sup> Jomini, the famous 19th Century Swiss theorist, described three kinds of military history; (1) recounting the minute details of a given battle, (2) using a campaign or battle to examine principles of war and to analyze the relationships between events and principles, (3) examining war in a broader spectrum including political factors.<sup>69</sup>

Military history education for officers at all Army Schools is both formal and informal. The formal program at all Army Officer Advanced Courses (OAC) includes three history courses. The first course analyzes the evolution of combined arms warfare. This course prepares captains to operate as members of a combined arms team by explaining the relationship among technology, organization, and tactics. The second course conducts a battle analysis and requires the officer to demonstrate an application of the battle analysis methodology. This occurs through the critical evaluation of material, logic, synthesis, selective research, and analysis. The third course allows the officer

to plan and conduct a staff ride. This field exercise reinforces the battle analysis methodology instruction.<sup>70</sup>

An excellent book written by John E. Jessup and Robert W. Coakley, The Guide to the Study and Use of Military History describes the benefits of studying and using military history: (1) The past is interesting; (2) Reading history is entertaining; (3) It examines the traditions of history; (4) It gives the reader a form of vicarious experience; (5) The reader gains an understanding of the present and guidance for the future; and (6) It broadens human understanding.<sup>71</sup> The authors go on to describe the value of studying military history is that this study: (1) sharpens the judgment and improves the perception of the officer, (2) broadens the perspective of the officer as his base of knowledge is expanded, (3) compensate for different experiences of individuals, (4) prepares an officer for war without experiencing combat and compensates for lack of training time, (5) gives an officer insight to current problems by studying past problems, (6) gives the officer an appreciation for the profession of arms, (7) develops leadership skills by enabling the officer to gauge the capacity and limitations of humans, (8) provides a forum for critical examinations of current or foreseeable problems, (9) enhances the vision of the officer by arousing curiosity about specific problems or developments, (10) emphasizes the confusing state of war, the lack of information during war, and the friction associated with war, and (11) presents qualities that past leaders have used to develop the ability to handle stress during war.<sup>72</sup>

Many articles in military publications address the value of using military history to prepare officers for combat. Marine Corps Major General Paul K. Van Riper, in "The Use of Military History in the

Professional Education of Officers" said "history is a surrogate for combat experience and every officer in the Marine Corps should study history during their career."<sup>73</sup> He further stated that there are three reasons why the study of military history is important. The first is that military history is a laboratory for the professional officer. The experiences acquired through studying history are perspective, inspiration, and wisdom. The second reason is it provides mental discipline and training. Analytical powers are improved with the recognition of the diverse ways of approaching military problems. Third, studying military history reinforces the values of the institution the officer serves.<sup>74</sup>

David B. Hawke provides a strong affirmation for the study of military history in "Military History and the Modern Soldier." He pointed out that the study of military history has been a key element in the professional development of America's great military leaders in the past. These include Theodore Roosevelt, Dwight D. Eisenhower, George S. Patton, Jr., Douglas MacArthur, and H. Norman Schwarzkopf. Hawke concludes by saying "the study of history can teach one how to think and consider all the variables."<sup>75</sup>

Jay Luvaas addressed the relevance of studying military history in "Military History: Is it Still Practical?" He said that it was practical as long as it yields lessons that are relevant to the current situation. The author offers insights on making history instructive. First, it enhances on what others have experienced. Reading and meditating on wars of the past is a way to learn the art of war. Second, the reader has an opportunity to learn from the mistakes of others. Third, the reader has an opportunity to get "inside the head"



of the person being studied. Fourth, it mentally tests the ability of officers.<sup>76</sup>

"The Use and Abuse of Military History" is explored by Michael Howard's article in the Royal United Service Institution Journal. Howard presented three rules for studying military history properly. First, the officer should study in width. Observe the evolution of warfare over the entire historical period. Look at the past, the current situation, and understand the relationship and changes between them. Second, the officer should study in depth by taking a single campaign and explore it in detail. Do not memorize but get "inside" the memoirs, letters, and diaries to feel the confusion and horrors of combat. This must be done to experience what war is really like. Third, the Officer should study in context by looking at the military, social, political, and economic factors. In short, Howard says that properly studying military history improves the competence of the professional Army Officer.<sup>77</sup>

The Chemical School studies the battle of Chickamauga and conducts a staff ride of the battlefield as part of the military history instruction in COAC. The military history program consists of 5-hours of instruction in the third and fourth weeks of the OAC that presents the evolution of combined arms warfare and the battle analysis methodology.<sup>78</sup>

The Chickamauga Staff Ride classes account for 31-hours of instruction beginning in the third week and ending in the fourteenth week. Chemical captains conduct a battle analysis of the Civil War Battle of Chickamauga, conduct personality briefs on key leaders, and

describe the dynamics of combat operations as they pertain to leadership and the principles of war.<sup>79</sup>

Although the military history courses at the Chemical School are valuable; the instruction does not focus on the study of the history of chemical warfare, a topic relevant in the professional development of chemical officers. In fact, there appears to be little information available on the study of the history of chemical warfare.

The study of the history of chemical warfare is not being utilized for training. The study of the history of chemical warfare would provide the chemical officer experiences of operations in a chemical environment.

In summary, the literature reinforces the benefits of the current leadership development process. Although the literature says much about the place of military history in the curriculum, it is silent on whether the history of chemical warfare enhances the leader development of the chemical officer and whether the study of this topic improves effectiveness in combat and in operations other than war.

### Endnotes

<sup>1</sup>John E. Miller, Speech Command and General Staff Officer's Course, Reserve Component Graduation Program, 15 December 1994, Fort Leavenworth, Kansas 66027.

<sup>2</sup>U.S. Army, FM 100-5, Operations, (Washington, DC: Department of the Army, June 1993), 1-9.

<sup>3</sup>Binford Peay III, "Building America's Power Projection Army," Military Review (July 1993): 10.

<sup>4</sup>Gordon R. Sullivan, "Leadership, Versatility, and All that Jazz," Military Review (August 1994): 6.

<sup>5</sup>Gordon R. Sullivan, "Ulysses S. Grant and America's Power Projection Army," Military Review (January 1994): 12.

<sup>6</sup>Mark D. Rocke, "Trust: The Cornerstone of Leadership," Military Review (August 1992): 35-36.

<sup>7</sup>U.S. Army, FM 100-5, Operations, (Washington, DC: Department of the Army, 1993), 2-9.

<sup>8</sup>Gordon R. Sullivan, "Leadership, Versatility, and All that Jazz," Military Review (August 1994): 5.

<sup>9</sup>Gordon R. Sullivan, "Ulysses S. Grant and America's Power Projection Army," Military Review (January 1994): 12.

<sup>10</sup>U.S. Army, TRADOC Pamphlet 525-5, Force XXI Operations, Headquarters, Department of the Army, Army Training and Doctrine Command, Fort Monroe, VA, (August 1994): 4-4.

<sup>11</sup>Perry Smith, Taking Charge, National Defense University Press, Washington D.C. (1986): 3.

<sup>12</sup>Jose A. Picart, "Expert Warfighters with Battlefield Vision," Military Review (May 1991): 51-53.

<sup>13</sup>James M. Kouzes and Barry Z. Posner, "The Credibility Factor: What People Expect of Leaders," Military Leadership, San Francisco, Westview Press, 1992, 136.

<sup>14</sup>Perry Smith, Taking Charge, (Washington, D.C.: National Defense University Press), 1986, 5.

<sup>15</sup>Wesley K. Roberts, "Battlefield Leaders for the Twenty-First Century: The Razors Edge of Leadership," Military Review (November 1988): 15.

<sup>16</sup>Richard M. Swain, "Adapting to Change in Times of Peace," Military Review (July 1994) 58.

<sup>17</sup>John W. Gardner, On Leadership, (New York: Free Press Macmillian Inc., 1990): 130-131.

<sup>18</sup>Perry Smith, Taking Charge, 5.

<sup>19</sup>Gordon R. Sullivan, "Ulysses S. Grant and America's Power-Projection Army," Military Review (January 1994): 14.

<sup>20</sup>Wesley K. Roberts, "Battlefield Leaders for the Twentieth-Century: The Razor's Edge of Leadership," Military Review (November 1988): 14.

<sup>21</sup>U.S. Army, TRADOC Pamphlet 525-5, Force XXI Operations, Headquarters, Department of the Army, Army Training and Doctrine Command, Fort Monroe, VA, (August 1994): 4-5.

<sup>22</sup>J. H. Binford Peay III, "Building America's Power Projection Army," Military Review (July 1994): 10.

<sup>23</sup>Gordon R. Sullivan, Memorandum titled "Leader Development," (18 February 1994): 2.

<sup>24</sup>Randall Rigby, Officer Professional Development Session with the Command and General Staff Course titled Professional Reading Program, (6 October 1994).

<sup>25</sup>Jose A. Picart, "Expert Warfighters With Battlefield Vision," Military Review (May 1991): 58.

<sup>26</sup>Roderick Magee, "Strategic Leadership," Military Review (February 1993): 42-43.

<sup>27</sup>J. Steve Patterson, "CAS3: Investment in the Future," Military Review (May 1994): 25.

<sup>28</sup>William M. Steele, "Army Leaders: How You Build Them, How You Grow Them," Military Review (August 1992): 20.

<sup>29</sup>Michael F. McNamara, "The Price of Remaining Amateurs in the Field of Education," Marine Corps Gazette, (February 1994): 55.

<sup>30</sup>*Ibid.*, 55.

<sup>31</sup>Herbert F. Harback, "The Threat to Strategic Leadership," Military Review (November 1992): 76.

<sup>32</sup>William M. Steele and Edward E. Thurman, "The Mind is the Key to Victory," Military Review (July 1993): 13.

<sup>33</sup>Mark D. Rendina, "An Officer Corps for the 1990's," Military Review (October 1990): 68.

<sup>34</sup>The Professional Development of Officers Study, Headquarters, Department of the Army, Washington D.C. 1985.

<sup>35</sup>Michael A. Anastasio, "Leader Development Direction for the Future," Military Review (May 1991): 14.

<sup>36</sup>Mark D. Rocke, "Trust: The Cornerstone of Leadership," Military Review (August 1992): 35-36.

<sup>37</sup>Mark D. Rendina, "An Officer Corps for the 1990s," Military Review (October 1990): 68.

<sup>38</sup>Jose A. Picart, "Expert Warfighting With Battlefield Vision," Military Review (May 1991): 58.

<sup>39</sup>Michael Anastasio, "Leader Development: Direction for the Future," Military Review (May 1991): 14.

<sup>40</sup>Robert D. Orton, Chemical Corps Professional Reading Program 1994.

<sup>41</sup>Michael Anastasio, "Leader Development: Direction for the Future," Military Review (May 1991): 16.

<sup>42</sup>Jose A. Picart, "Expert Warfighting With Battlefield Vision," Military Review (May 1991): 59.

<sup>43</sup>*Ibid.*, 59.

<sup>44</sup>U.S. Army, Army Focus 1992: The Army in Transformation, Department of the Army, Washington D.C., (September 1992): 36.

<sup>45</sup>Peter P. Perla, "Future Directions for Wargaming," Joint Force Quarterly (Summer 1994): 78.

<sup>46</sup>Gordon R. Sullivan, "Moving into the 21st Century: America's Army," Military Review (July 1993): 10.

<sup>47</sup>*Ibid.*, 11.

<sup>48</sup>U.S. Army, Louisiana Maneuvers, Department of the Army, Washington D.C., (March 1994): 14-15.

<sup>49</sup>*Ibid.*, 9.

<sup>50</sup>U.S. Army, Army Focus 1993, Moving Out To The 21st Century, Department of the Army, Washington D.C., (September 1993): 32.

<sup>51</sup>Ralph Kerr, "Dragon Warfighter Center," Army Chemical Review, (January 1995): 40.

<sup>52</sup>Larry Northup, Course Manager, Chemical Officer Advanced Course, interview by author, Fort Leavenworth, KS, 1 December 1994.

<sup>53</sup>Robert J. Coughlin, Director of Training, Chemical School, 1st endorsement to Memorandum: 19 November 1993, titled "Applications of Simulation Technology in NBCD Training."

<sup>54</sup>Robert Root, Chief of Technical Training Department, Chemical School, Point Paper: 17 November 1993, titled "Use of Brigade/Battalion Simulation System for Training NBC Defense."

<sup>55</sup>Based on notes during classroom instruction at the Command and General Staff College on 4 January 1995, dealing with Operations Research and the analytic techniques, one of which is simulation. The instructor noted that computer simulation does not measure agility, synchronication, depth, initiative, intuition and panic.

<sup>56</sup>Notes of LTC John Fugate, Committee Chairman, and past combat developer at the Chemical School.

<sup>57</sup>U.S. Army, FM 100-5, Operations, Department of the Army, Washington D.C., (1993): 1-1.

<sup>58</sup>U.S. Army, TRADOC Pamphlet 525-5, Force XXI Operations, Headquarters, United States Army Training and Doctrine Command, Fort Monroe, Virginia 23651 (August 1994): 4-2.

<sup>59</sup>Michael R. Rampy, "The Keystone Doctrine: FM 100-5, Operations," Military Review (June 1994): 17.

<sup>60</sup>Ibid., 18.

<sup>61</sup>Ibid., 21.

<sup>62</sup>Larry Northup, Course Manager, Chemical Officer Advanced Course, interview by author, Fort Leavenworth, KS, 15 November 1994.

<sup>63</sup>Larry Northup, Course Manager, Chemical Officer Advanced Course, interview by author, Fort Leavenworth, KS, 15 November 1994.

<sup>64</sup>U.S. Army, FM 3-3, Chemical and Biological Contamination Avoidance, Department of the Army, Washington D.C., (1992): v.

<sup>65</sup>U.S. Army, FM 3-4, NBC Protection, Department of the Army, Washington D.C., (1992): ii.

<sup>66</sup>U.S. Army, FM 3-5, NBC Decontamination, Department of the Army, Washington D.C., (1993): iii.

<sup>67</sup>U.S. Army, FM 3-19, NBC Reconnaissance, Department of the Army, Washington D.C., (1993): ii.

<sup>68</sup>John E. Jessup, Jr. and Robert W. Coakley, The Guide to the Study and Use of Military History, (Center of Military History, U.S. Army): 27.

<sup>69</sup>Ibid., 14.

<sup>70</sup>U.S. Army, STP 21-II-MOS, Military Qualification Standards II, Washington D.C.: Department of the Army, 1991): 4-43.

<sup>71</sup>Jessup and Coakley, 29.

<sup>72</sup>Ibid., 31.

<sup>73</sup>Paul K. Van Riper, "The Use of Military History in the Professional Education of Officers," Marine Corps Gazette, (February 1994): 51.

<sup>74</sup>Ibid., 50.

<sup>75</sup>David B. Hawke, "Military History and the Modern Soldier," Military Review (January 1993): 58.

<sup>76</sup>Jay Luvaas, "Military History: Is it Still Practical?" Parameters-Journal of the US Army War College, (March 1982): 2.

<sup>77</sup>Michael Howard, "The Use and Abuse of Military History," Royal United Service Institution Journal (RUSI), (February 1962): 3.

<sup>78</sup>Larry Northup, Course Manager, Chemical Officer Advanced Course, interview by author, Fort Leavenworth, KS, 1 December 1994.

<sup>79</sup>Larry Northup, Course Manager, Chemical Officer Advanced Course, interview by author, Fort Leavenworth, KS, 15 December 1994.

CHAPTER THREE  
RESEARCH METHODOLOGY

Statement of the Problem

This research analyzes how the study of the history of chemical warfare can prepare chemical officers to function as effective leaders in combat and in operations other than war. The analysis will answer the following subordinate questions:

1. How does the Army develop officers as leaders?
2. How does the study of doctrine develop leaders?
3. How does the study of military history develop leaders?

The focus was to identify how the study of the history of chemical warfare can prepare chemical officers to functions effectively in combat and in operations other than war.

Methodology Used

The research methodology used for this study was primarily descriptive in nature. The research focused on two dimensions: leadership development and the use of military history instruction at the Chemical School. The essence of the methodology used for this study examined the development of chemical officers and whether the study of the history of chemical warfare would enhance the development of these officers.



### Data Needed

The data needed for this research came from three primary sources: Center for Army Research Library (CARL), the Chemical School curriculum, and interviews with faculty members at the Chemical School.

The research literature consisted of U.S. Army doctrinal manuals, military history, leadership materials, historical studies of chemical warfare, and theses.

### Analysis of the Data

The primary method of data analysis consisted of verification and comparison. Data was analyzed to determine whether it was relevant to the training of chemical officers to perform their duties in a chemical environment. Second, the analysis attempted to identify whether the curriculum block on military history included the history of chemical warfare. And third, this study established an arbitrary criteria of effectiveness to identify and to serve as a possible benchmark for continuing research to further test the hypothesis that studying the history of chemical warfare further enhances the development of the chemical officer. Thus, if 10 percent of the military history instruction included the history of chemical warfare then it was concluded that this curriculum was marginally effective in preparing chemical officers for their duties. If 25 percent of the military history instruction included the history of chemical warfare, then it was concluded that the curriculum was effective in preparing chemical officers for their duties. And if 50 percent of the military history curriculum included the history of chemical warfare then it was

concluded that the curriculum was highly effective in preparing chemical officers for their duties.

## CHAPTER FOUR

### ANALYSIS

Wisdom in war comes from experience, and the greatest source of experience for an officer is military history . . . . The study of military history orients an officer within his calling, instills in him the values of the institution he serves, inspires loyalty, and reinforces existing traditions.<sup>1</sup>

Major General Paul K. Van Riper,  
Marine Corps Gazette

### Introduction

The purpose of Chapter four is to analyze the material to answer the research question: How would the study of the history of chemical warfare prepare chemical officers to function as effective leaders in combat and in operations other than war? To answer this question, the following subordinate questions are answered:

1. How does the Army develop officers as leaders?
2. How does the study of doctrine develop leaders?
3. How does the study of military history develop leaders?

### Military History

The study of military history is an important element of the leader development curriculum. To answer the research question, it is essential to examine in detail the strengths of the study of military history at the Chemical School.

First, it is held that military history instruction helps develop officers who are tactically competent and confident, versatile, and open-minded leaders. By studying past military leaders, students begin to understand the evolution of modern warfare and the leaders role.

Second, military history at the Chemical School is incorporated into the leadership block to reinforce leadership principles. Leadership of Civil War leaders is discussed after a presentation of the film Glory.

Third, instead of conducting only ten hours of military history instruction as required by TRADOC, the Chemical School conducts 38 hours. Included in this total is the study of the battle of Chickamauga and a staff ride to the battlefield. The military history program itself consists of 5-hours of instruction in the third and fourth weeks of the course. This instruction presents the evolution of combined arms warfare and the battle analysis methodology.<sup>2</sup>

The Chickamauga Staff Ride classes account for 31 hours of instruction integrated throughout the course. Patterned after the Command and General Staff College's Staff Ride and instruction, the Chemical School conducts a Staff Ride to the Chickamauga battlefield. During this period of instruction the students conduct a battle analysis of the Civil War Battle of Chickamauga and present personality briefings on key leaders. Further, they describe the dynamics of combat operations as they pertain to leadership and the principles of war.<sup>3</sup>

However, this brings us to the weaknesses concerning the military history instruction at the Chemical School. At best, the military history instruction at the Chemical School provides a

superficial knowledge of combat operations in the Civil War that reinforces the difficulties of combat, but is not adequately focused at the chemical officer. The military history instruction is not focused or personalized so it is relevant for chemical captains. However, the question that goes unanswered is what professional benefit do chemical captains get from this? The Staff Ride to Chickamauga could be chemically personalized by zeroing in on the effects of smoke at the battlefield, the effect of fire on the soldier, the effect of poor medical care and the associated diseases, the effect of gun powder on the soldiers, and how a chemical attack can replicate the shock action of Longstreet's attack. Instructing chemical captains to fight the battle with chemical weapons would make the Staff Ride relevant for chemical officers. In this regard, the Aviation School did this for their Chickamauga Staff Ride by requiring aviation captains to employ and fight the battle using aviation assets.<sup>4</sup>

The Infantry School personalized the Chickamauga Staff Ride for the Battalion and Brigade Pre-Command Course in 1990. During the Staff Ride to the Chickamauga battlefield, the use of the Battlefield Operating Systems (BOS) explained the battle. Along with other subject matter experts in the appropriate BOS, the Infantry School's NBC instructor facilitated a discussion with the students on how NBC would affect the battle.<sup>5</sup>

Ironically this idea is not new to the Chemical Corps. The Chemical Warfare School's Line and Staff Course chemically personalized the history instruction in the 1920's. They did this during instruction and visits to the Gettysburg Battlefield. Situations given to the students challenged them to fight the Civil War Battle in a simulated

chemical environment. Military history reinforced the study of chemical warfare principles and agents.<sup>6</sup>

Second, the study of military history at the Chemical School does not focus on the study of the history of chemical warfare, a topic extremely relevant in today's world of proliferation of weapons of mass destruction among third world countries. Thus the study of the history of chemical warfare is a tool available that the Chemical School is not using to develop chemical officers.

#### Arguments against including in the Curriculum

Although there is very little available information on why chemical officers should not specifically study the history of chemical warfare, there are several related arguments or positions why the history of chemical warfare is not taught. Of the many reasons the following four reasons reinforce the argument that the history of chemical warfare should not be part of the curriculum.

First is that the study of the history of chemical warfare is not a science. It cannot provide practical answers to current problems. This was an argument against the study of military history put forth by Jay Luvas in his article "Military History: Is It Still Practical" in which he said that history is an art and there are no pat answers.<sup>7</sup> Harold R. Winton expressed the same concern about studying military history in his article "Reflections on the New Air Force's New Manual." He expressed concern that the Air Force was using the study of military history and historical analysis to deduce a doctrine. He said that conducting historical analysis alone cannot answer the question on how the future will resemble the past.<sup>8</sup>

Second is that the evolution of modern warfare toward the information age and high-technical warfighting may preclude the use of chemical weapons in future battles. Colonel Gary B. Griffin discussed the future of battle in his article "Future Foes, Future Fights." He wrote that future armies of highly developed nations will use precision-strike weaponry that will redefine the classic relationship between fire and maneuver in the next war. In essence he said high technological weaponry and the ability to conduct information operations will preclude the execution of current conventional tactical operations.<sup>9</sup> This will include the employment of chemical weapons as well.

Third is that the study of the history of chemical warfare is different from studying what happened in the past in chemical environments. It is what a historian said happened in the past. Thus what you get is a prejudiced view of what happened that is dependent on the author's preconceived ideas about the usefulness and humaneness of chemical warfare.<sup>10</sup> John Keegan in The Face of Battle discussed this problem when he wrote that historians can distort perspective and produce biased work.<sup>11</sup>

And the fourth is that the study of the history of chemical warfare could promote institutional needs or dogma. Again Harold R. Winton expressed the same concern about studying military history in his article "Reflections on the New Air Force's New Manual."<sup>12</sup> This concern is applicable for studying the history of chemical warfare at the Chemical School.

### Arguments for the Study of the History of Chemical Warfare

Although there is very little available information on why chemical officer's should specifically study the history of chemical warfare, there are several related arguments or positions used to support the study of the history of chemical warfare. These arguments include:

First chemical weapons may be used in the future. This disputes the argument that the evolution of modern warfare toward an information age and high-technical warfighting may preclude the use of chemical weapons in the future. Unfortunately the proliferation of weapons of mass destruction makes the employment of chemical weapons more likely. According to Colonel Griffin's article "Future Foes, Future Fights," forces not as technically advanced as the U.S. will most likely fight with weapons of mass destruction to include biological and chemical weapons.<sup>13</sup> Although the U.S. has ruled out using chemical weapons, many other countries have not taken chemical weapons out of their arsenal.<sup>14</sup>

Second it provides a laboratory for the chemical officer to gain vicarious experience. Marine Corps Major General Paul K. Van Riper described this in his article "The Use of Military History in the Professional Education of Officers." He said that the experiences gained by studying will give officers a perspective and wisdom for the future battlefield.<sup>15</sup> Thus, for the chemical officer, the study of the history of chemical warfare can provide the experiences needed to perform in a chemical environment. This is important since the U.S. Army has not fought in a chemical war since World War I.



Major General Bernard Loeffke, U.S. Army retired, expressed it best when he wrote that the study of military history can provide experiences on what wins and loses wars.<sup>16</sup> Maybe this is the reason why General Matthew B. Ridgeway wrote about gaining experiences from the study of history in his article "Leadership." He wrote that officers should read and study all the history and biography and learn from all the personal experiences of battle-tested officers.<sup>17</sup>

Third the study of the history of chemical warfare provides the chemical officer intellectual training and discipline. General Ripper discussed how the study of history can expand the analytical powers of the officer as he expands his knowledge base. He reinforced the idea that the more a person studies within his field, the more likely he will be able to make judgments and conclusions of value.<sup>18</sup> It is through studying the history of chemical warfare that the chemical officer can broaden his understanding of an art that one can never hope to completely understand.<sup>19</sup> This will allow chemical officers to make the intellectual leap from theory to practice in times of combat. This point was echoed by General Frederick M. Franks, US Army retired, when he said that "the more you study the principles, theories and lessons . . . the better prepared you will be to make the intellectual leap from theory to practice."<sup>20</sup>

This intellectual development of officers is one reason the Command and General Staff College included military history in its curriculum. Colonel Jerry D. Morelock, Director of the Combat Studies Institute at the Command and General Staff College, stated that history

is a medium in which officers can test their own intellectual skills and imagination against the complexities of warfare. He also said it is useful in the training of the professional imagination of all officers.<sup>21</sup> This aspect of studying history is the essence of what David B. Hawke said was the main reason for studying history. He said that it "teaches one how to think and consider all the variables."<sup>22</sup>

The idea of using history in the intellectual development of officers is also catching on with the sister services. The Air Force has recently started using the study of history to develop analytical thought and intuition in it's officers. Harold R. Winton in "Reflections on The Air Force's New Manual" said that historical analysis can introduce intellectual honesty and rigor into the doctrinal development process as the analysis is available for all officers to refute or confirm.<sup>23</sup>

And finally, chemical warfare history develops professional ideas by orienting the officer within his specific field of expertise and instilling the values of the institution.<sup>24</sup> Consequently, former Chief of Staff of the Army, General Carl E. Vuono, said that it is through history that the worth of our profession is conveyed. He believes that through history we can envision the responsibilities of our predecessors and form the expectations that our nation and our institutions expect of us.<sup>25</sup> Lieutenant Colonel Price T. Bingham, U.S. Air Force, retired, discussed how the study of military history helped orient Air Force officers within their area of expertise. He said that

Air Force doctrine calls for professional education that encourages analytical thought and innovation in solving problems. He said that the new doctrinal document AFM 1-1, Basic Aerospace Doctrine of the United States Air Force, includes 25 historical essays to stimulate analytical thought. Analyses of these essays provide comprehensive reasoning and evidence for each doctrinal principle. According to Professor I. B. Holley, this use of history allows anyone to "replicate the reasoning and make use of factual evidence from which doctrinal writers derive their generalizations."<sup>26</sup> Thus, history is used by the Air Force to reinforce professional ideas.

#### Benefits to Studying the History of Chemical Warfare

The last phase of the research focused on how the study of the history of chemical warfare helps to achieve the six objectives of the leader development process. An analysis of how the study of the history of chemical warfare develops officers with the six objectives follows:

Objective of Tactically and Technically Competent and Confident Officers: Doctrine is the best tool for developing competent officers. However, complimenting doctrinal instruction with studies of chemical warfare during past conflicts (World War I, Italy-Ethiopia conflict, Iran-Iraq War, and Gulf War) allow the individual officer to make his own analysis on the lessons learned from past conflicts. This analysis will allow the officer not only to state doctrinal principles but to answer the "why" aspect of doctrinal principles. It is the ability to do this analysis that enhances the credibility of chemical captains as

they have an opportunity to understand the "why" aspect of doctrinal principles.

Objectives of Intuition, Versatility, Open-Mindedness, and

Credible Spokesperson: Major Jose A. Picart said that a broad but detailed knowledge base that is organized into accessible categories is essential to develop warfighting skills. This knowledge is the foundation for developing officers who are situationally aware, intuitive, visionary, open-minded, and credible spokespersons. The officer gains this knowledge through firsthand experiences, usually provided by the tool of simulation, particularly during field exercises. Picart says it is these firsthand experiences in simulation or field exercises that develop the knowledge base that is essential for developing intuition, vision, and versatility in officers.<sup>27</sup>

While Picart stresses that the best way to get this knowledge is through first-hand experiences, he also acknowledges that detailed and extensive studying of history contributes to acquiring this knowledge base. Obviously, firsthand experience is best in gaining this knowledge, but if it is not available due to the lack of funds or availability to participate in exercises, then the second best option is the extensive study of history. Picart notes that extensive study leads directly to acquiring warfighting expertise such as intuition, versatility, and open-mindedness.<sup>28</sup> One way to way to get this knowledge about chemical matters is to study about it. Again, firsthand experience in an NBC environment is more memorable than studying about

it but since the U.S. has not been in a war involving chemical weapons since 1917, studying about chemical warfare during past conflicts is the best way to understand about warfare in a chemical environment. Therefore, one way to gain the knowledge that places chemical captains in a position to be versatile, intuitive, visionary, and credible spokespersons in chemical matters is to study the history of chemical warfare at the Chemical School and as part of their self-development.

The study of the history of chemical warfare allows the officer to expand his vision of chemical warfare as he given the opportunity to think and reflect about the evolution of chemical warfare and combined arms warfare. The strength of World War II leaders came from their opportunity to think and reflect about war during attendance at Army Schools.<sup>29</sup> The education Army Officers received at Army Schools between World War I and World War II was essential in those leaders being open-minded and able to rapidly adjust to the vigor of World War II. In fact, Representative Ike Skelton of Missouri, in 1987 called for a return of military excellence of Army Schools that existed in the 1920s and 1930s.<sup>30</sup>

Objective of Understanding Technology: The study of the history of chemical warfare does not help the chemical officer in understanding current technology. However, using history to understand the evolution of chemical weapons provides the officer the background to understand how technology has improved the lethality of weapons systems. This is very important to understand in analyzing how chemical weapons

may be used in the future. Thus a balance can be struck between the demands of moving toward technology and the idea that our past is still applicable. This will enable the chemical officer to understand that he can learn from past warfare, keeping in mind that technology has changed the face of warfare to some extent.<sup>31</sup>

Overall, the study of the history of chemical warfare is a tool that may be used to develop chemical captains who are technically competent and confident, are versatile, are situationally aware, are intuitive, are open-minded, and are credible spokespersons.

#### Summary

Chapter Four examined the reasons against and for including the study of the history of chemical warfare in the Chemical School curriculum and concluded that this topic provides an important resource to develop chemical captains. Studying the history of chemical warfare at the Chemical School would create chemical captains rich in chemical history and having the required knowledge to be versatile, intuitive, creative, and articulate chemical officers. This aids the Chemical School in developing captains with the required experience necessary to perform during combat in a chemical environment.

### Endnotes

<sup>1</sup>Paul K. Van Riper, "The Use of Military History in the Professional Education of Officers," Marine Corps Gazette, (February 1994): 50.

<sup>2</sup>Larry Northup, Course Manager, Chemical Officer Advanced Course, interview by author, Fort Leavenworth, KS, 15 December 1994.

<sup>3</sup>Larry Northup, Course Manager, Chemical Officer Advanced Course, interview by author, Fort Leavenworth, KS 1 December 1994.

<sup>4</sup>Mark Evetts, Command and General Staff College Student, formerly Small Group Instructor for them Aviation Officer Advanced Course, interview by author, Fort Leavenworth, KS, 15 November 1994.

<sup>5</sup>Based on author's experience at the Infantry School as an NBC Instructor from 1988 to 1990.

<sup>6</sup>John C. MacArthur, "A Gas Problem for the Garrison School," Chemical Warfare, Vol 11, No 11, (November 1925): 16.

<sup>7</sup>Jay Luvaas, "Military History: Is it still Practical?" Parameters-Journal of the US Army War College, (March 1982): 2.

<sup>8</sup>Harold R. Winton, "Reflections on The Air Force's New Manual," Military Review(November 1992): 26.

<sup>9</sup>Gary B. Griffin, "Future Foes, Future Fights," Military Review, (November 1994): 56.

<sup>10</sup>Michael Howard, "The Use and Abuse of Military History," The Royal United Service Institution Journal (RUSI), (February 1962): 3.

<sup>11</sup>John Keegan, The Face of Battle, Vintage Books, New York 1977, 27.

<sup>12</sup>Harold R. Winton, "Reflections on The Air Force's New Manual," Military Review (November 1992): 26.

<sup>13</sup>Gary B. Griffin, "Future Foes, Future Fights," Military Review, (November 1994): 58

<sup>14</sup>John A. Mojecki, "Mission-Essential Training and Weapons of Mass Destruction," Military Reveiw (October 1994): 91.

<sup>15</sup>Paul K. Van Riper, "The Use of Military History in the Professional Education of Officers," Marine Corps Gazette, (February 1994): 50.

<sup>16</sup>Bernard Loeffke, "One Place, Three Wars: Part 1," Infantry Magazine, (May-June 1991): 15.

<sup>17</sup>Matthew B. Ridgeway, "Leadership," Military Review (October 1966): 49.

<sup>18</sup>Paul K. Van Riper, "The use of Military History in the Professional Education of Officers," Marine Corps Gazette, (February 1994): 50.

<sup>19</sup>Matthew B. Ridgeway, "Leadership," Military Review (October 1966): 49. Reference for this sentence came from this article.

<sup>20</sup>Frederick M. Franks, "Matters of the Mind and the Heart," Military Review (March 1993): 7.

<sup>21</sup>Jerry D. Morelock, The Evolution of Modern Warfare, U.S. Army Command and General Staff College, Fort Leavenworth, KS 1994: i.

<sup>22</sup>David B. Hawke, "Military History and the Modern Soldier," Military Review (January 1993): 66.

<sup>23</sup>Harold R. Winton in "Reflections on The Air Force's New Manual," Military Review (November 1992): 26.

<sup>24</sup>Paul K. Van Riper, "The use of Military History in the Professional Education of Officers," Marine Corps Gazette, (February 1994): 50.

<sup>25</sup>Carl E. Vuono, "Professionalism and the Army of the 1990s," Military Review (April 1990): 7-8.

<sup>26</sup>Price T. Bingham, "The Air Force's New Doctrine," Military Review (November 1992): 13.

<sup>27</sup>Jose A. Picart, "Expert Warfighters with Battlefield Vision," Military Review (May 1991): 51-53.

<sup>28</sup>*Ibid.*, 56.

<sup>29</sup>Paul F. Gorman, The Secret of Future Victories, Combat Studies Institute, U.S. Army Command and General Staff College, Fort Leavenworth, Kansas 66027, (February 1992): 1-3.

<sup>30</sup>Ike Skelton, "American Strategy: A Worthy Past, an Uncertain Future," Congressional Record 133, No. 179, October 6, 1987.

<sup>31</sup>Richard A. Preston and Sydney F. Wise, Men in Arms, Holt, Renhart and Winston, (1979): 3.



## CHAPTER FIVE

### CONCLUSIONS AND RECOMMENDATIONS

History teaches how to win wars. Reading history exposed us to what wins and what loses conflicts.<sup>1</sup>

Major General Bernard Loeffke,  
U.S. Army (Retired)

This study and analysis of how would the study of the history of chemical warfare prepare chemical officers to function as effective leaders in combat and in operations other than war has suggested that studying the history of chemical warfare at the Chemical School is an important but neglected part of the curriculum.

#### Conclusion

After analyzing the reasons against and for including the study of the history of chemical warfare in the Chemical School curriculum, the conclusion is that the study of the history of chemical warfare does prepare chemical officers to function as effective leaders in combat and in operations other than war.

The study of the history of chemical warfare offers chemical captains a usable past--a means to understand where chemical warfare fits within combined arms warfare. It further assists in the development of imagination and is a powerful tool in providing a broad wealth of experience that could be useful in a war involving chemical weapons or the threat of chemical weapons.<sup>2</sup>

### Recommendations

The Chemical Corps and the Army needs to consider using the study of the history of chemical warfare during past conflicts to supplement the current tools of the leader development process. This tool, which is beneficial in the development of chemical captains, must be integrated into the curriculum at the Chemical School, aggressively promoted as part of studies at the Chemical School, and used for Chemical officer self-development. The following recommendations are provided:

First, integrate vignettes from past chemical leaders such as Major General (Retired) Gerald G. Watson, who resided over the renaissance of the Chemical Corps. Integrating vignettes from key leaders makes the leadership block relevant to chemical captains by using history relating to the chemical field to focus the instruction towards dealing with leadership issues affecting chemical captains. Implementing this recommendation would call for the Small Group Instructor to take the current vignettes as described in FM 22-100, Military Leadership and replace them with chemically focused vignettes.

Second, chemically personalize the history block. First, chemically personalize the Staff Ride similar to what the Aviation School does. Challenge the students as they walk the battlefield to think about how chemical agents could be employed and the impact they may have on the battlefield. Actually, this is not a new idea. As referenced in Chapter Four, The Chemical Warfare School's Line and Staff Course in the 1920s did this by combining the study of the Battle of Gettysburg and training on chemical tactics and employment by chemically

personalizing the study of the Gettysburg Battlefield. Another way to chemically personalize the military history instruction and other blocks of instruction is to integrate NBC related articles and vignettes into the curriculum. Integrating recent past chemical experiences in combat such as the Iran-Iraq War and OPERATION DESERT SHIELD AND STORM into the curriculum is one technique. If the Chemical School integrated articles and vignettes about chemical experiences in combat, the instruction and the readings might be more relevant and more appealing to chemical officers. To implement this recommendation, there would be no additions required for the curriculum, rather a refocusing of the current instruction by the instructors.

Third, integrate chemically related vignettes into the Chemical and Biological (CB) block. Integration of chemically related vignettes to supplement doctrinal instruction is an effective way of ensuring chemical captains understand the "why" of doctrinal principles. Since these vignettes would be part of the readings required by the curriculum, no additional time would be required for classroom instruction, just the additional effort by the instructors to develop the vignettes.

Fourth, incorporate articles and interviews of what chemical captains did during the Gulf War into the curriculum of the CB block. Again, no additional classroom time is needed, just the additional effort by the instructors to develop the articles and interview so they can be read by the students as part of the readings required for the course.

Fifth, challenge chemical captains by performing battle analysis of battles or campaigns where chemical agents were employed or

were threatened to be employed. This could be done as part of the CB block or as part of self-development studies. There are many battles and references to choose from such as Rexmond C. Cochrane's Studies of Gas Warfare during World War I, articles on the use of gas against Ethiopia by the Italians, the use of gas by Iraq against Iran, and articles on the response of the U.S. Army against the chemical threat during OPERATION DESERT SHIELD AND STORM. These battle analyses would be challenging and beneficial to students as reflective thinking should occur if conducted properly. This recommendation would require one additional hour of classroom time per week. If the leadership of the Chemical School cannot allocate this time, then the recommendation could be implemented by requiring the students to conduct the battle analysis individually for turn in to the instructors for grading.

Sixth, start showing during the CB block a film the Chemical School produced that features the Threat Office's Lee Waters analysis of the Al Faw and Fish Lake battles with and without the use of chemical weapons. This film describes the impact of chemical weapons during the battles in a way that a combat arms officer can understand without proclaiming that the employment of chemical weapons won the war. Implementation of this recommendation would require an additional 15-minutes of classroom time. This time could come from classroom PE time in the CB block or be shown as part of the classified threat brief given by the Threat Office.

And the final recommendation is for the Smoke block. Again, the use of battle analysis is again recommended. A battle analysis on using smoke to conceal the crossing at Arnaville (9-14 September 1944) during World War II would be a good start. Charles B. MacDonald, in the

book Three Battles: Arnaville, Altuzzo, and Schmidt, U.S. Army in World War II, writes about the experiences of the 84th Chemical Company in the first-ever smoke mission of a river crossing during an assault. Another battle analysis could be done about the use of smoke by Egypt during the attack against Israel at the Bar-Lev Line in 1973. This recommendation could also be implemented as part of self-development studies.

#### Suggestions for Further Research

First, conduct controlled curriculum testing to validate including the history of chemical warfare into the curriculum at the Chemical School.

Second, two years after testing the curriculum, conduct follow-up field tests to determine what effect this curriculum change has had on the development of the chemical captains.

### Endnotes

<sup>1</sup>Bernard Loeffke, "One Place, Three Wars," Infantry, (May-June 1991): 15.

<sup>2</sup>Jerry D. Morelock and Scott Stephenson, The Evolution of Modern Warfare, Combat Studies Institute, U.S. Army Command and General Staff College, Fort Leavenworth, Kansas, (December 1994): i.

## BIBLIOGRAPHY

### Books

- Gardner, John W. On Leadership. Free Press Macmillian Inc. New York, New York (1990): 130-131.
- Gorman, Paul F. The Secret of Future Victories. Institute for Defense Analysis, Combat Studies Institute, U.S. Army Command and General Staff College. Fort Leavenworth, Kansas (February 1992): 1-3.
- Jessup, John E. Jr., and Robert W. Coakley. The Guide to the Study and Use of Military History. Center of Military History, United States Army, (1991): 14-27.
- Keegan, John. The Face of Battle. Vintage Books, New York, New York. (1977): 24-27.
- Kouzes, James M., and Barry Z. Posner. "The Credibility Factor: What People Expect of Leaders." Military Leadership. Westview Press, San Francisco, California, (1992): 136.
- Morelock, Jerry D., and Scott Stephenson. The Evolution of Modern Warfare. U.S. Army Command and General Staff College, Fort Leavenworth, Kansas 1994.
- Preston, Richard A., and Sydney F. Wise. Men in Arms. Holt, Renhart, and Winston, New York, New York (1979): 3.
- Smith, Perry. Taking Charge. National Defense University Press. Washington D.C. (1986): 3-5.

### Government Publications

- U.S. Army. DA Pam 600-32, Leader Development for America's Army. Washington, DC: Department of the Army, March 1994.
- U.S. Army. FM 3-3, Contamination Avoidance. Washington, DC: Department of the Army, 1992.
- U.S. Army. FM 3-4, Protection. Washington, DC: Department of the Army, 1992.
- U.S. Army. FM 3-5, Decontamination. Washington, DC: Department of the Army, 1993.

U.S. Army. FM 3-19, NBC Reconnaissance. Washington, DC: Department of the Army, 1993.

U.S. Army. FM 100-5, Operations. Washington, DC: Department of the Army, 1993.

U.S. Army. STP 21-II-MOS, Military Qualification Standards II, Washington D.C.: Department of the Army, 1991.

#### Interviews

Evetts, Mark. Command and General Staff College Student, interview by author, Fort Leavenworth, Kansas 15 November 1994.

Northup, Larry. Course Manager, Chemical Officer Advanced Course, interview by author, Fort Leavenworth, Kansas 1 December 1994.

Northup, Larry. Course Manager, Chemical Officer Advanced Course, interview by author, Fort Leavenworth, Kansas 15 December 1994.

#### Magazines and Newspaper Articles

Anastasio, Michael A. "Leader Development Direction for the Future." Military Review. (May 1991): 14.

Bingham, Price T. "The Air Force's New Doctrine." Military Review. (November 1992): 13.

Franks, Frederick M. "Matters of the Mind and the Heart." Military Review. (March 1993): 7.

Griffin, Gary B. "Future Foes, Future Fights." Military Review. (November 1994): 56.

Harback, Herbert F. "The Threat to Strategic Leadership." Military Review. (November 1992): 76.

Hawke, David B. "Military History and the Modern Soldier." Military Review. (January 1993): 58-66.

Howard, Michael. "The Use and Abuse of Military History." Royal United Service Institution Journal (RUSI). (February 1962): 1-3.

Howard, Michael. "Military Science in an Age of Peace." Royal United Service Institution Journal (RUSI). (March 1974): 3-9.

Kerr, Ralph. "Dragon Warfighter Center." Army Chemical Review. (January 1995): 40.

Kuhnhehn, James. "Should Military Focus on War or on Peace." The Kansas City Star, 2 October 1994, m-1.



- Loeffke, Bernard, "One Place, Three Wars: Part 1." Infantry Magazine. (May-June 1991): 15.
- Luvaas, Jay. "Military History: Is it Still Practical?." Parameters-Journal of the U.S. War College. (March 1982): xxx.
- Magee, Roderick. "Strategic Leadership." Military Review. (February 1993): 42-43.
- Mojecki, John A. "Mission-Essential training and Weapons of Mass Destruction." Military Review. (October 1994): 91.
- McNamara, Michael F. "The Price of Remaining Amateurs in the Field of Education." Marine Corps Gazette. (February 1994): 55.
- Patterson, J. Steve. "CAS3: Investment in the Future." Military Review. (May 1994): 25.
- Peay, Binford III. "Building America's Power Projection Army." Military Review. (July 1993): 10.
- Perla, Peter P. "Future Directions for Wargaming." Joint Force Quarterly. (Summer 1994): 78-83.
- Picart, Jose A. "Expert Warfighters with Battlefield Vision." Military Review. (May 1991): 51-53.
- Rampy, Michael R. "The Keystone Doctrine: FM 100-5, Operations." Military Review. (June 1994): 17.
- Rendina, Mark D. "An Officer Corps for the 1990's." Military Review. (October 1990): 68.
- Richardson, William R. "Training: Preparation for Combat." Military Review. (June 1986): 6.
- Ridgeway, Matthew B. "Leadership." Military Review. (October 1966): 49.
- Roberts, Wesley K. "Battlefield Leaders for the Twenty-First Century: The Razors Edge of Leadership." Military Review. (November 1988): 15.
- Rocke, Mark D. "Trust: The Cornerstone of Leadership." Military Review. (August 1992): 35-36.
- Schwarzkoft, H. Norman. "Judging Errors of Judgement." The Retired Officer Magazine. (December 1994): 30.
- Skelton, Ike. "American Strategy: A Worthy Past, An Uncertain Future." Congressional Record 133. No. 179. (October 1987)

- Steele, William M. "Army Leaders: How You Build Them, How You Grow Them." Military Review. (August 1992): 20.
- Steele, William M., and Edward E. Thurman. "The Mind is the Key to Victory." Military Review. (July 1993): 13.
- Swain, Richard M. "Adapting to Change in Times of Peace." Military Review. (July 1994): 58.
- Sullivan, Gordon R. "Moving into the 21st Century: America's Army." Military Review. (July 1993): 10-11.
- Sullivan, Gordon R. "Leadership, Versatility, and All that Jazz." Military Review. (August 1994): 6.
- Sullivan, Gordon R. "Ulysses S. Grant and America's Power Projection Army." Military Review. (January 1994): 12.
- Winton, Harold R. "Reflections on the Air Force's New Manual." Military Review. (November 1992): 26.
- Winton, Harold R., and Hartmut H. Lau. "History and the Professional Soldier." Military Review. (April 1974): 32-38.
- Vuono, Carl E. "Professionalism and the Army of the 1990's." Military Review. (April 1990): 7-8.
- Van Riper, Paul K. "The Use of Military History in the Professional Education Of Officers." Marine Corps Gazette (February 1994): 48-53.

#### Memorandums

- Coughlin, Robert J. "Applications of Simulation Technology in NBCD Training." Fort McClellan, AL, 19 November 1993.
- Root, Robert. "Use of Brigade/Battalion Simulation system for Training NBC Defense." 15 December 1994.
- Sullivan, Gordon R. "Leader Development." 18 February 1994.

#### Special Reports and Studies

- Cochrane, Rexmond C. "The End of the Aisne-Marne Campaign August 1918." U.S. Army Chemical Corps Historical Studies: Gas Warfare in World War I (June 1959): 1-50.
- Cochrane, Rexmond C. "Gas Warfare at Belleau Wood, June 1918." U.S. Army Chemical Corps Historical Studies: Gas Warfare in World War I (June 1957): 1-79.

Cochrane, Rexmond C. "The 5th Division Captures Frapelle, August 1918." U.S. Army Chemical Corps Historical Studies: Gas Warfare in World War I (March 1958): 1-49.

Cochrane, Rexmond C. "The 89th Division in the Bois de Bantheville, October 1918." U.S. Army Chemical Corps Historical Studies: Gas Warfare in World War I (June 1960): 1-89.

Cochrane, Rexmond C. "The 29th Division in the Cotes de Meuse, October 1918." U.S. Army Chemical Corps Historical Studies: Gas Warfare in World War I (October 1959): 1-81.

Cochrane, Rexmond C. "The 78th Division at the Kriemhilde Stellung, October 1918." U.S. Army Chemical Corps Historical Studies: Gas Warfare in World War I (July 1957): 1-86.

Cochrane, Rexmond C. "The 33rd Division Along The Meuse River, October 1918." U.S. Army Chemical Corps Historical Studies: Gas Warfare in World War I (July 1958): 1-95.

Heller, Charles E. Chemical Warfare in World War I: The American Experience, 1917-1918. Leavenworth Papers No. 10 (Fort Leavenworth, KS: Combat Studies Institute, U.S. Army Command and General Staff College, 1984).

Oschner, Herman. "History of German Chemical Warfare in World War II: Part I The Military Aspect." U.S. Army Chemical Corps Historical Studies. (January 1949)

#### Pamphlets

United States Army. Army Focus 1992. The Army in Transformation. Department of the Army. Washington D.C. (September 1992): 36.

United States Army. Army Focus 1993. Moving Out to the 21st Century. Department of the Army. Washington D.C. (September 1993): 32.

United States Army. Battle Labs. United States Army Training and Doctrine Command. Fort Monroe, Virginia (May 1994): 1-16.

United States Army. Chemical Corps 2000. United States Army Chemical School. Fort McClellan, Alabama (1993): 1-12.

United States Army. Corps Battle Simulation NBC Book. United States Chemical School. Fort McClellan, Alabama (April 1993): 1-50.

United States Army. TRADOC Pamphlet 525-5. Force XXI Operations. United States Army Training and Doctrine Command. Fort Monroe, Virginia (August 1994): 4-4.

United States Army. Louisiana Maneuvers. Department of the Army. Washington D.C. (March 1994): 1-15.

### Speeches

Miller, John E. Command and General Staff Officer's Course Reserve  
Component Graduation Program. 15 December 1994. Fort  
Leavenworth, Kansas

Rigby, Randall. Officer Professional Development Session with the  
Command and General Staff Course titled "Professional Reading  
Program." Fort Leavenworth, KS, 6 October 1994.

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